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Developing Vegetation Management Plans for Ski Areas that Integrate with Master Planning

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ABSTRACT

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TITLE: Developing Vegetation Management Plans for Ski Areas that Integrate with Master Planning

ABSTRACT: The 1986 Ski Area Permit Act requires vegetation management plans for ski areas operating on National Forests but little exists to guide their development and implementation. Often plans are poorly integrated with the ski area master plan which has contributed to poor resort design and unnecessary resource impacts.

The aim of this paper is to develop guidelines to assist resource managers and planners in the development and implementation of vegetation management plans and to illustrate how resource inventories guide and integrate with ski area master plan development and implementation.

Keywords: Ski Areas, Winter Sports Sites, Vegetation Management, Resource Inventories, Master Plans

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EXECUTIVE SUMMARY

Title: Developing Vegetation Management Plans for Ski Areas that Integrate with Master Planning

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Summary:

* The intent of the paper is to outline for resource managers and planners the basic steps for developing vegetation management plans for ski areas operating on National Forests and to illustrate how resource inventories can integrate with ski area master planning.

* The research is primarily based on personal experience and study involving recreation and natural resource management planning with 7 major winter sports sites on three National Forests. The research analyzed what worked and what did not work in past resource management plans and master planning efforts. The steps that have worked best for developing vegetation management plans are summarized and suggestions for integrating resource management plans with ski area master planning are offered.

* Good vegetation management planning for ski areas should take the following basic steps:

1) Stand delineation and inventory. Recognize and map the vegetation pattern of the site and background area.

2) Develop stand management objectives. This is the most critical step in the process. Stand management objectives must balance recreation potential (master plan design criteria), aesthetics, biological and other physical constraints with the overall ecological objectives; on a forest landscape scale.

3) Stand diagnosis. What is the condition of the stand health? What are the stands' capabilities and constraints? What can be done to meet the master plan design criteria and stand management objectives?

4) Identify high priority stands for treatment. Use stand management objectives to drive the selection.

5) Develop detailed stand prescriptions. Prescriptions should be developed interactively with the master planning process.

6) Develop an implementation schedule the integrates with the master plan implementation schedule and the ski area annual operating plan.

The following should be considered when trying to integrate vegetation management plans with ski area master planning:

* The master planning process is a dynamic give and take between master plan design criteria and resource constraints and capabilities.

* Planning starts with identifying the constraints and capabilities of resources. Recognize and map the vegetation pattern of the site and background landscape and use the pattern and the constraints and capabilities as a basis for design.

* Develop master plan design criteria that help meet public and resource objectives along with ski area resort management objectives.

* Look for opportunities to combine management objectives during master plan implementation.

* Use good stand management objectives to drive the development of the vegetation management plan.

* This dynamic and interactive process of balancing design criteria and constraints and capabilities of all resources is the key to good master planning.

Introduction

The 1986 Ski Area Permit Act requires ski areas operating on National Forests to include vegetation management as a section of the ski area operating plan. In general, vegetation management plans along with other resource inventories such as hydrologic assessments, cultural resource and soils surveys, visual assessments, and wildlife inventories, have been included in ski area master plans. They are typically added as appendices. In some cases, vegetation management plans have been identified as a required mitigation measure in the environmental analysis of the master plan. Ski areas operating on National Forests are integrally involved in vegetation management planning.

Although vegetation management plans have been developed for ski area master plans and are now required in operating plans little exists to guide their development and implementation. This has often resulted in plans that are not well integrated with ski area master planning and implementation.

There are a number of consequences due to poor resource integration with master planning. First, resource protection tends to be an "add on" item rather than being incorporated into design.. Resource managers are forced into developing mitigation rather than avoiding resource impacts by design. Second, poor resource integration simply leads to poor design. Designing without a full understanding of resource constraints and capabilities will lead to design problems and negative resource impacts. Not integrating resource constraints and capabilities into design will result in not optimizing the recreation potential of the site. Finally, there is a growing need for resource managers to do a better job fitting forest management activities into the broader concept of landscape ecology, and this can only be accomplished by integrating resource concerns into the master planning process.

Resource plans should go beyond integration with resort master planning. Resource plans should help drive the planning process. This will enhance the quality of skiing experience, while minimizing impacts to natural resources.

Following are guidelines for development and implementation of vegetation management plans, and illustrations of how resource inventories, such as vegetation management plans, guide and integrate with master plan development and implementation.

Guidelines for Developing Vegetation Management Plans

The process for developing a vegetation management plan will include the following basic steps:

1) Delineate and inventory tree stands.

2) Develop stand management objectives.

3) Complete stand diagnosis.

4) Identify high priority stands for treatment.

5) Develop detailed stand prescriptions.

6) Develop implementation plan that integrates with master plan implementation and operating plan.

1) Stand delineation and inventory.

Stands or vegetated "sites" are delineated and mapped within the ski permit area using aerial photography. Inventory data is collected for those sites. Most Forest Service District offices have this step completed. If not, stand delineation and stand exams should be completed following Forest Service procedures outlined in documents such as the "Silvicultural Examination and Prescription Handbook", (FSH 2409.26d, R-2 4/90 Amend 90-1).

2) Stand Management Objectives.

What do you want the plan to accomplish? The development of stand management objectives is probably the most critical and least understood step in the process. "Past [vegetation management] plans have been timber oriented with little sensitivity to ski area management objectives and special problem areas, thus were faulted from the beginning by restrictive and unrealistic stand objectives" (Kowynia, 1984). Stand management objectives drive the development of the vegetation management plan. Stand management objectives must balance recreation potential (master plan design criteria), aesthetics, biological and other physical constraints and capabilities, and overall ecological objectives on a forest landscape scale.

Stand management objectives are usually unique to each area but may include objectives such as:

* "To create and maintain a natural appearing mosaic of forest, shrub and grass species.

* To create and maintain stands that are aesthetically pleasing and that enhance the skiing experience and summer recreation use.

* To create and maintain stands that are healthy and vigorous and where possible, multi-storied, multi-aged, and mixed species that are resistant to fires, diseases and insects infestations.

* To create and maintain the integrity of stand fragments to enhance the [functional and recreational] potential of the ski area", (Kowynia, 1984).

* To mitigate visual impacts of past ski area development.

This step is best accomplished by an interdisciplinary team of ski area management, Forest Service winter sports specialists, and other resource specialists. " An interdisciplinary team should be established to formulate a scope of work to develop the vegetation plan and follow through in approval and implementation," (Region 2, Winter Sports Guidebook, 1992).

3) Stand Diagnosis

Once stand management objectives are developed, stand diagnosis can be completed following Forest Service procedures referenced above.

From the stand (or site) exam data, and using stand management objectives, analyze stand attributes such as plant associations, structure, composition, density and condition; in order to develop alternatives for treatment.

What is the condition of the stand health? Given the objectives (master plan design criteria), what can be done to meet those objectives?

This step is done by a Forester working for the Forest Service or by a private consulting forester.

4) Identify High Priority Stand for Treatment.

Using stand management objectives to drive the selection, list stands that should be entered in the planning period (usually ten years or less).

Balancing all objectives, (ski area management (master plan), recreation potential, visuals, biological and other resource objectives) select stands that are most critical to meet those objectives and that are the most practical to enter first. For example, if an important objective is to improve visual impacts, then stands that cover areas where visual problems exist should fall out as high priority for treatment, if all other resource objectives are equal.
This step is best accomplished by an the interdisciplinary team.

5) Develop Detailed Stand Prescriptions.

From the alternatives for treatment identified in the stand diagnosis, develop stand prescriptions for the high priority stands and integrate with the master plan.

Prescriptions are usually written by a forester or certified silviculturist in close consultation with the interdisciplinary team and ski area planners. The silvicultural prescriptions should consider and balance all management objectives and avoid focusing exclusively on biological concerns.

The prescriptions should be developed interactively with the master planning process.

6) Develop an implementation schedule for vegetation management that integrates with the master plan implementation schedule and annual operating plan.

The ski area master plan will outline development phases and may include an implementation schedule for development. The vegetation management plan should reflect the implementation schedule. Prescriptions for high priority stands should be implemented when development occurs for specific projects through the annual operating plan. It is most efficient to implement stand prescriptions in conjunction with tree removal for master plan development projects.

Planners generally know how to build "good" ski areas: ski areas that work well from a functional skiing stand point; that have design criteria that cover traffic patterns, capacity balance, and snow quality. Planners do not yet know how to build ski areas that integrate all resource concerns into master planning - planning that results in "great" ski areas that are not only a pleasure to ski but minimize resource impacts and fit well into the landscape ecology.

Vegetation management considerations both drive and are driven by the master planning process. This is generally true for all resource concerns. Which comes first: resource concerns or master planning?

A good place to start to solve this riddle is to recognize "mountains as integrated systems," (Dorward, 1991). "Trail planners today must consider the environmental and visual impacts of development on the mountain as well as the integration of mountain facilities into a comprehensive system of transportation, accommodations, and services at the base," (Dorward, 1991).

I. The Master Plan is Driven by Resource Constraints and Capabilities.

Resource concerns need to be integrated into overall mountain planning from the start. "Resource inventories provide a baseline description of existing conditions prior to development", (USFS, Region 2, Winter Sports Guidebook, 1992). "Inventory and analysis of the physical and environmental conditions of a site [can] lead planners to identify logical and sound development alternatives", (Wingle, 1993). Resource inventories are used to estimate both opportunities and constraints," for development, (USFS, Region 2, Winter Sports Guidebook, 1992). Constraints and capabilities of the physical resource are the basic building blocks of the master plan.

"Vegetation is the physical component of the landscape character" (Dorward, 1990) that has planning implications that are visual, biological, and physical. "An analysis of the landscape [and specifically an analysis of the landscape matrix which is the dominant vegetation pattern] reveals places where it is important to preserve, maintain, create or re-create particular vegetation communities in order to achieve area goals, such as increasing elk numbers," (Apostol,1992), or to provide a specific recreation experience such as downhill skiing.

An example of a vegetation constraint and capability that needs to be identified by planners is a tree stands' ability to absorb change. "The vulnerability of a landscape- it's ability to absorb change without losing it's visual character- depends on the degree of diversity in its vegetation, rock outcrops, and water features; the extent to which landform and vegetation can screen changes and the ability of its vegetation to recover from disturbances. Measurements of vulnerability and visual sensitivity can be mapped to show where develoment would be least intrusive" (Dorward, 1990).

"By using basic visual management concepts [such as Visual Quality Objectives and Visual Absorption Capabilities] and principles from the start, it is possible to provide information regarding the best location for development..." (National Forest Landscape Management Handbook, 1984).

Other physical and biological constraints and capabilities of vegetation that need to be identified by planners include stand windfirmness, resistance to fire, and resistance to disease and insect infestations. If all other constraits such as falline and slope aspect are equal, planners may choose to develop a trail by removing a stand that has been identified for a low resistance to insect infestation and retain more resistant stands, for example.

Tree species, structure, size and age class will indicate what type of development tree stands will best lend themselves to. For example, multi-aged, shade tolerant stands such as spruce and fir lend themselves to glade and island development better than even-aged shade intolerant stands such as lodgepole pine. "Glades should be maintained or, if even-aged, converted to an uneven-aged, clumpy, stand structure," (Kowynia, 1984).

Through the inclusion of required mitigation measures identified in the environmental analysis the master plan is ultimately driven by resource constraints and capabilities. "Integration of required mitigation measures planned to protect scenic and natural resources with the basic design criteria established for the resort is appropriate and in many instances will insure their adoption," (Forest Service, Region 2, Winter Sports Guidebook, 1992).

The bottom line for planners is to recognize and map the vegetation pattern of the site and background and use the pattern as a basis for design along with other physical constraints such as slope, aspect, wind, etc. "Each plant community has its' own visual and ecological patterns. If native plants are combined in ways that contradict the patterns in which they naturally occur, the built environment may not feel in harmony with the site", (Dorward, 1990).

II. Vegetation Management Planning is Driven by the Master Plan.

The master plan also determines how the vegetation management plan is developed and implemented. If physical resource constraints and capabilities are the basic building blocks of the master plan, then master plan design criteria guide how the blocks are put together.
Master plan "design criteria provides the necessary direction for determining the quality, appearance and design theme essential for resort planning and establish the standard to which the resort will be constructed," (Forest Service, Region 2, Winter Sports Guidebook, 1992). Master plan design criteria specify how resources are developed and protected.

There may be design criteria that guide how the mountain will be developed to minimize visual impacts and how the mountain will fit into the background and overall landscape ecology. Design criteria that guide this visual concept of how the mountain will look ultimately temper how vegetation can be modified for the development. To achieve the goal of having the development repeat natural background vegetation patterns, stands should be modified to repeat those background patterns in conjunction with development.

The master plan will affect priorities for stand treatment based on how critical the tree stands are for protecting natural resource values, for protecting the development investment and for enhancing the skiing experience. From a practical stand point, the master plan implementation schedule drives the implementation of the vegetation management plan. Tree stands are most practically treated while equipment and roads are in place for construction projects.

During master plan implementation, planners should look for opportunities to combine objectives as much as possible. As an example, when faced with an existing technical lift upgrade, planners should use this opportunity to address other objectives, such as improving the visual impact of past development, and improving downhill capacity acreage. A true interdisciplinary approach will insure that there is a good balance of resource and ski area management objectives.

Conclusion

Vegetation management considerations along with other resource concerns both drive and are driven by the master planning process. The master plan process is a dynamic give and take between master plan design criteria and resource constraints and capabilities.

Planning starts with identification of the constraints and capabilities of physical, biological and visual resources. Recognize and map the vegetation pattern of the site and background landscape. Use the pattern, constraints, and capabilities of vegetation as a basis for designing the master plan. Also consider other constraints and capabilities such as slope, aspect, wind patterns, location of drainages, location of cultural resources, soils, wildlife, threatened and endangered species, and location of wetlands. These constraints and capabilities are the basic building blocks of the master plan.

It is recommended that a guide be developed to help planners recognize the constraints and capabilities of vegetation species common to ski areas and that also identifies the types of ski area development those species are best suited for.

Develop master plan design criteria that help meet public and resource objectives along with ski area resort management objectives. Master plan design criteria guide how the resource constraints and capabilities are used to optimize the resort design while minimizing impacts to natural resources.

Look for opportunities to meet resource management objectives during master plan implementation of specific projects. Retrofitting a ski area master plan with technological upgrades such as new lift technology or other improvements such as adding trail capacity, may provide an opportunity to implement visual mitigation improvements on past development through the vegetation management plan. Develop an implementation schedule for vegetation management that coincides with the master plan implementation schedule.

Use good stand management objectives to drive the development of the vegetation management plan. In order to integrate vegetation management into master planning, stand management objectives must balance master plan design criteria with resource constraints and capabilities.

This dynamic and interactive process of balancing design criteria and constraints and capabilities of resources is the key to good master planning.

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